Lectures.

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REMARKS UPON TWO CASES OF LEAD-POISONING EXHIBITING NERVOUS AND MUSCULAR SYMPTOMS.

Gentlemen: The two cases now brought before you are very striking ones, each showing marked implication of the muscles, though through different causes. I bring them in together because they both have the same disease.

CLINICAL HISTORY OF FIRST CASE.

Andrew M. is forty-two years of age, a house-painter. This man has been working in white lead for thirty-one years and has had frequent attacks of colic. We also learn that these occurred in spite of the fact that he has been in the habit of taking whiskey, as a prophylactic. Notwithstanding the faithful use of his antidote, he has had pains at least a dozen times, so he says, and in referring to them he describes the usual symptoms of lead-poisoning. About a year ago he had a similar attack for which he was treated in this hospital; he went out relieved of his constipation and pain but not entirely well; he states that he was out of sorts for several months. When he returned to his work he followed a branch of the business in which there was no lead used.

SYMPTOMATOLOGY; MUSCULAR SPASM; PARALYSIS.

Four months ago, he began again to work in white lead paint, and about three weeks ago he noticed a stiffness or tonic spasm of the muscles of the thumb and fingers which held the brush, in both hands, for he was in the habit of changing the brush from one hand to the other, while painting. This difficulty he found to be greater in the afternoon than in the morning; that is, the stiffness increased when he had been some hours at work. After a few days the loss of power extended from the fingers to the hand, so that he could no longer hold the brush. First, he says there was spasmodic action of the muscles concerned in holding the brush, and afterwards came loss of power; he next noticed that his wrists were weak, and soon he could not hold anything. His bowels were then obstinately constipated, requiring him to employ opening medicine. This shows that muscles in other parts of the body were beginning to be affected, constipation and lead colic being caused by paralysis of the muscular coat of the intestinal tube. During the preceding attacks his gums had been very sore, and the teeth loose. Just before his admission, eight days ago, a similar set of symptoms manifested themselves.

NERVOUS PHENOMENA.

Upon entering the ward he was noticed to be, as he still is, pale and weak. He has marked tremor in both his hands, but much more in the left than the right. There is some wrist-drop besides this tremor, the hand hangs down; there is, as you see, also a want of general power in this arm, the hand not only trembles, but he also cannot hold it out except for a very brief period. These are the symptoms he presents now, which were also noticed upon admission. There is no trembling at present in the muscles at the wrist; he calls our attention, however, to the fact that while there is no persistent tremor, there is an occasional jerk in the muscles, even when the limb is at rest, but as you see, the least effort to use the hand will produce this trembling motion.

[1] Reported for the Boston Medical and Surgical Journal.

CONDITION OF MUSCLES, ETC.

Now, gentlemen, I have told you the general history of this case, and I can supplement it by some facts which strengthen his statements. First, let me say, that he has no headache, but has great muscular soreness all over the body, and winces when he is touched as if it hurt him. He actually dreads to be touched. Upon testing the cutaneous sensibility, I find that this is, really, as I have described it to you, a muscular soreness; when I take hold of the skin and pinch it there is no evidence of increased sensibility. He says that he feels it just as anybody would. The muscular soreness is less in the hands, but even in the muscles of the forearm, where as I pinch him, now, there is not much tenderness, as I press deeper pain is evoked. Muscular soreness is then very decidedly present. You see, also, that he is to a certain extent paralyzed, at least muscular movement is very much impaired. He has difficulty in taking off his coat. There is atrophy of the arms, and upon inspection, every now and then I see fibrillary contractions of the muscles, especially around the shoulder. The muscular groups, both flexors and extensors, are wasted. Atrophy of all the muscles of the arm and forearm co-exists, therefore, with this muscular soreness; this in both arms. The muscles of the hand, especially of the ball of the thumb, are deficient; while markedly sensitive they are decidedly atrophied; the interossei are less so.

He never has had headache nor giddiness; but he sleeps poorly, he says he has bad nights, and thinks that it is the pain that prevents him from sleeping. His vision is good, except that the left eye was injured by an accident some years ago. His appetite is very good, and he digests the food he takes. The bowels are opened by medicine, the salines being sufficient to keep them in a soluble condition. His tongue is white, flabby, and tremulous. He has a most thoroughly characteristic blue line on the gums; nor is the blue line confined to the teeth where it is partially obscured by the tartar, but you see a blue stain upon the lower lip upon its mucous surface. His breath, moreover, is very offensive, and the gums are spongy. He thinks himself that this condition was due to some mercury which he had taken as a purgative, but the evidence on this point is very doubtful. Indeed, the resident physician tells me that a good deal that he said when he came in about mercury and the like, was due to hallucination. The man since has been found to be subject to hallucinations.

The urine has been free from albumen; the quantity and appearance are normal. The body temperature is not elevated. Pulse is feeble and compressible, and the action of the heart distinct; the second sound is not quite so sharp as in health, the first is of normal volume.

REACTION TO ELECTRICITY.

Now, gentlemen, it is very evident what is the matter with this man; it is a case of most aggravated lead-poisoning with all the peculiar muscular and nervous symptoms characteristic of lead. I will finish our clinical record of the case by testing the condition of the

muscles with the battery; and I might add to our former observations that the muscles of the lower extremity also appear wasted as they are also sore to the touch. What do we find to be the electrical reaction? There is unusual amount of insusceptibility to the action of the faradic current; the muscles barely move under a strong current, while you perceive that it hurts him. That is in the extensor group of the left forearm. Now we are trying the biceps, which contracts a little better. It is very clear that the electro-muscular sensibility and contractility are better preserved in the biceps than in the extensor groups of arm and forearm. The right is similarly affected, but less than the left. Under a strong current the flexors of the right arm also move better than the extensors. Therefore, while the muscular contractility in the upper extremities is everywhere diminished, this is true to a less degree in the flexors than in the extensors. The same reduction of muscular action under the faradic current exists in the lower limbs, though it is nowhere completely abolished.

CLINICAL HISTORY OF SECOND CASE; EXAMINATION.

Let us now investigate case two, which is also one of lead-paralysis: William D., forty-one years of age. He has been a house-painter for sixteen years but never had lead colic until two years ago, but he has had it each summer since then. He is temperate. He noticed that he had lost some power in his hands last summer, and three months later he had to give up work on account of inability to use his hands. His bowels were constipated, his appetite good; upon admission he had most marked wrist-drop in both arms, more so than in the other case. He also showed atrophy, and general, though not complete, loss of power in his limbs. Notice the atrophy; there is also characteristic wrist-drop and with it wasting of the muscles, particularly of the forearm. The muscles of the ball of the thumb are almost gone, there is scarcely anything of the thenar eminence left in this hand, but there is a little more in the right; the interossei muscles do not seem to be very much affected. Muscular soreness there is none. The case differ from the preceding one also in the fact that there is no wasting of the lower extremities, which are well developed. He can kick vigorously. He says, however, that he had some loss of power in the lower limbs, though of late they have been much better; it now no longer exists. You can see the difficulty he has in making motions of the forearm, the extensor group of muscles is especially implicated. Let us look at his gums. There is a most marked blue line. He thinks that he has never had fetor of the breath; and he has no nervous symptoms; no headache, nor hallucinations, as in the man we just saw; nor is there any tremor, and he informs us that he has never observed muscular twitching.

We will now also test him with the battery. With a very strong current the extensor muscles contract, the electro-muscular sensibility seems well preserved, though he has no power in the extensor muscles, and even with a strong current we cannot make the wrist bend backwards. In the biceps the muscular contraction is good, very different from the extensor group, and in the flexors of the forearm it is good, slightly impaired as compared with the normal, but still very fair.

SUMMARY OF TREATMENT.

You have now seen these two instructive cases; I will indicate their treatment, reserving some remarks upon it until afterwards. This man is employing the battery, daily, with the faradic current, on the muscles of the forearm, particularly the extensors. He is also using the iodide of potassium (ten grains thrice daily), and has been purged with sulphate of magnesia. He has also been taking strychnia now for about a week, and has already commenced to improve. He takes a thirtieth of a grain three times daily. There has been no evidence of lead in the urine, although we sometimes do find lead discharged by the kidneys after giving iodide of potassium.

The former case is also taking the iodide (ten grains three times a day), and a saline purge; he has not taken strychnia. What shall be done for the muscular pain and restlessness? I will order —

℞ Chloral. hydrat. . . . . gr. xv.
Tinct. cannabis indicæ. . . . . gtt. v.
Syrup. tolutani . . . . . } āā 3j. M.
Aquæ . . . . . }

To be taken each night, and repeated if necessary. We will not begin the battery with him for the present until we see how the muscular soreness is influenced. He shall be kept upon the potassium iodide, and occasional purges of Epsom salt.

These two cases of lead-poisoning, in one affecting principally the nervous, in the other the muscular, system, are of more than usual interest, and more than usual gravity; they present the typical symptoms about as well marked as you will ever see them. As we have considered their clinical history, and examined them fully, let us now take up the prognosis and treatment.

PROGNOSIS.

The prognosis in both, I think, is favorable; I believe, that both, if treatment be continued, will recover. In case number one with the great disturbance of the nervous system, hallucinations, restlessness, tremor, and muscular soreness in addition to the paralysis and atrophy, I think that a longer time will elapse before perfect recovery than in case number two; still, here, too, recovery will finally take place, and in the short time he has been in the hospital a marked amelioration is noticeable in the phenomena; although the gain in power is decided, yet he still exhibits the curious muscular trembling. His digestion is better, the bowels regular.[1] This case did receive some treatment prior to coming into the hospital, but in case two I do not think that there was any particular treatment, at least what it was he does not exactly know.

DISCUSSION OF TREATMENT.

Let us inquire into the principles of our treatment, and explain why we use certain remedies in preference to others. Both patients are taking iodide of potassium. In other respects their treatment is quite different except that both take sulphate of magnesia as a purgative. Let us first consider the points in treatment that both have in common: the iodide of potassium and a saline each morning. The reason for exhibiting the former is that this is the most powerful agent that we have to eliminate lead from the tissues; a double decomposition is said to occur, and the iodide of lead is discharged in soluble form. But it is not merely for its chemical effects upon the lead that it is so valuable, but also for its influence upon general

[1] A week later the muscular soreness was much diminished, he slept well, and had no more hallucinations. The general improvement was marked. — REP.

nutrition, for correcting the process of degeneration in the muscles, and removing the stiffness and soreness caused by the lead. For these reasons we find iodide of potassium valuable in other forms of metallic poisoning, even in chronic poisoning by arsenic. Whatever be the *rationale* by which it acts, it does more good than any other therapeutic agent in chronic lead-poisoning. With this view I have placed both cases upon it, and they have responded in a marked manner. That is one point they have in common. Secondly, they have in common the use of salines, sulphate of magnesia. This is indicated because in all cases of chronic lead-poisoning there is torpor of the bowels, and constipation; frequently, in grave cases, there is lead colic, and these were no exception to this general rule: one had repeated attacks, and the other had an attack while in the ward. Then, I say, the object of treatment is to keep the bowels soluble; and to overcome the constipation purgatives generally are necessary. For a long time the sulphate of magnesia has been especially valued in this connection, it has, indeed, a popular reputation as a remedy for lead colic. Whether on account of the sulphuric acid which it contains or not, it has undoubtedly good effects, and has advantages over other popular laxatives in use. At La Charité Hospital in Paris, it was regarded not merely as a laxative but also as an important agent in aiding to eliminate the lead from the system.

Now we will take up the points of treatment in which the cases differ. Chloral, at night, in case number one, on account of the state of his nervous system, his restlessness, hallucinations, and pain, which prevented him from sleeping. Partly, then, to procure rest, and partly for its effect upon the nervous system, we gave the hypnotic. In cases like number two, where the difficulty seemed more localized than in the other, where we have more wrist-drop, I rely more upon galvanism and strychnia. Now, strychnia is a particularly advantageous remedy in cases of lead poisoning, especially long-standing cases in which there exists more decided paralysis or wrist-drop. It is a remedy, I think, which has been far too much neglected. I have read somewhere of strychnia being given in as high as grain doses in lead poisoning. I confess that I was incredulous about it, but when I reflect that when the system is under the influence of one poison it takes correspondingly large doses of another poison to affect it, I am willing to maintain that if only well borne, large doses may do a great deal of good. The strychnia has been supplemented by the battery, but the strychnia does as much good as the electricity. I generally order the strychnia in granules, commencing with a thirtieth, but I have more confidence in the hypodermic use in these cases, using at first one half this dose. In these old cases the strychnia, hypodermically, does more good than when given internally. Where the paralytic affection is localized the battery is of the greatest possible use; where the disorder is general, as in case one, it is of little benefit. There is a belief that you sometimes get results from the continuous current that you cannot obtain from the faradic current, and in obstinate cases I would advise you to try both. Sometimes the muscles will react to the continuous current when they will not to the interrupted, especially when the system is under the influence of lead. It has therefore been asserted that it should be used more frequently than the latter, but where, as in the present case, the muscles react to the faradic current, and the patient is still improving, I can see no reason for changing it.

PROPHYLAXIS.

With these remarks I intended to conclude our consideration of these cases, but one other point occurs to me. Suppose these men go away from here to return to their business, can we give them anything to prevent subsequent attacks? Nothing that I know of will avail except perfect cleanliness. The skin should be kept perfectly clean by a bath at the close of the day. They should live in the open air, do their work in a well-ventilated room, and stop work as soon as "the gripes" appear. It is claimed that sulphuric acid will prevent lead poisoning, and in white lead manufactories they sometimes give the workmen sulphuricacid lemonade. In practice, however, this does not so happen; indeed, sulphate of lead itself has caused lead poisoning. In point of fact, in many white lead works the use of this acid has been stopped on account of its not proving efficient. When the system is saturated with lead vapor baths may aid in getting rid of some of it through the skin by encouraging perspiration, but the essential part of the prophylaxis in a person very susceptible to the poison is to escape from the influence of the lead by a change in the occupation or surroundings.

Original Articles.

IN WHAT CASES SHALL THE MEDICAL EXAMINER DECLINE TO VIEW A DEAD BODY?[1]

BY MEDICAL EXAMINER ALFRED HOSMER, M. D., OF WATERTOWN.

THE medical examiner forms a conspicuous and important element in that vast system of protection which it has been found necessary to establish for the community. In one of his relations to the public he is, but in no menial sense, a servant, and as such he should be willing, prompt, and obedient. With this idea in mind I have never failed to report for duty whenever a requisition has been made for my official services. Yet it has sometimes happened that after reaching the place where immediate action on my part was expected, I have been forced to the conclusion that the case in hand not being among those contemplated and provided for by the statute of 1877, I had derived no authority from that act to take cognizance of it, and have therefore declined to hold a view in the legal sense of the phrase.

For instance, one morning a police officer requested me to give immediate attention to a case which had occurred five miles away, in the district of Medical Examiner ——, then absent. At much personal inconvenience I responded to the summons without delay. I found in the custody of the undertaker the body of an elderly man, who, early in the day, while in company with a friend, had died suddenly in the street. Careful interrogation failed to discover any suspicion that the death was not a natural one, and also elicited the statement that the deceased had recently consulted a neighboring physician. The fact that the death had been both public and sudden was assigned as the only reason for calling a medical examiner. Yet a little reflection will satisfy all that neither of these features in that case could be considered *per se* as proof of

[1] Read before the Massachusetts Medico-Legal Society.